Amdt of 6-23-04

EX. Amdt. 8-10-04 p.h.

IN THE SPECIFICATION

Please amend the specification as follows:

Please replace the original specification with the attached Substitute Specification.

IN THE CLAIMS

This listing of the claim will replace all prior versions and listings of claims in the present application.

Listing of Claims

Claims 1-21 (canceled)

22. (currently amended) A plasma generation apparatus, comprising:

a vacuum vessel having a plasma generation region established in an interior thereof;

a gas inductor that inducts discharge gas into said interior of said vacuum vessel;

an exhaust that exhausts an atmosphere in the interior of said vacuum vessel;

a tube-shaped discharge electrode fashioned so as to enclose said plasma generation region;

a first high-frequency electric power applicator that applies first high-frequency electric power to said discharge electrode;

a first magnetic force line generating portion positioned near one end portion of an outer periphery of said discharge electrode; and

a second magnetic force line generating portion positioned near the other end portion of an outer periphery of said discharge electrode,

wherein said first and second magnetic force line generating portions generate magnetic force lines having portions roughly parallel to the center axis of said discharge electrode, such that the length of said parallel portions becomes longer the closer said magnetic force lines are to said center axis, said magnetic force lines being capable of trapping electrons at least in a center of said plasma generation region, ~~and~~

~~wherein at least one of said first and second magnetic force line generating portions is overlapped with one end portion of the outer periphery side of the discharge electrode including the one end thereof~~.

Claim 23 (canceled)

24. (previously presented) A plasma generation apparatus according to claim 22, wherein said first magnetic force line generating portion is fashioned so as to output magnetic force lines in said plasma generation region, and

wherein said second magnetic force line generating portion is fashioned so as to input said magnetic force lines having been output in said plasma generation region by said first magnetic force line generating portion.

25. (previously presented) A plasma generation apparatus according to claim 24, wherein said first magnetic force line generating portion comprises:

a first magnet unit, and is fashioned so that a N pole of said first magnet unit faces said plasma generation region and an extended line of a straight line

connecting a N pole and a S pole of said magnet intersects a center axis of said discharge electrode substantially perpendicular to a peripheral direction of said discharge electrode, about at a right angle, and

wherein said second magnetic force line generating portion comprises:

a second magnet unit, and is fashioned so that a S pole of said second magnet unit faces said plasma generation region and an extended line of a straight line connecting a N pole and a S pole of said magnet intersects said center axis of said discharge electrode about at a right angle.

Claims 26-34 (canceled).

35. (previously presented) A plasma generation apparatus according to claim 42, further comprising:

a position adjuster that adjusts positions of said two walls in said center axis of said discharge electrode.

36. (previously presented) A plasma generation apparatus according to claim 42, wherein one of said two walls is used as gas diffusion plate for diffusing said discharge gas in said plasma generation region, and

wherein the other of said two walls, when said plasma is used in subjecting objects to be treated to prescribed treatments, is used as a holder for holding said objects to be treated.

37. (currently amended) A plasma generation apparatus according to claim 22, wherein said ~~first and second magnetic force line generators generate magnetic force lines having portions roughly parallel to a center axis of said discharge electrode, such that the length of said parallel portions becomes longer the closer said magnetic force lines are to said center axis, said magnetic force lines being capable of trapping electrons at least in a center of said plasma generation region~~magnetic force lines generated by said first and second magnetic force line generators being shaped so that they do not intersect upper and lower walls of said vacuum vessel in the center of said plasma generation region.

Claim 38-40 (canceled).

41. (previously presented) A plasma generation apparatus according to claim 42, wherein said two walls are electrode.

42. (previously presented) A plasma generation apparatus according to claim 22, further comprising:

two walls positioned so as to sandwich said plasma generation region between them, in the direction of the center axis of said discharge electrode, for defining the scope of said plasma generation region in the direction of the center axis.

Claims 43-45 (canceled).

Ex. Amdt.

46. (previously presented) A plasma generating apparatus according to claim 22, wherein at least one of said first and second magnetic force line generating portions is overlapped with one end portion of the outer periphery side of the discharge electrode including the one end thereof.

47. (previously presented): A plasma generating apparatus according to claim 22, wherein a magnetic pole of said first magnetic force line generating portion on the plasma generation region side is opposite to a magnetic pole of said second magnetic force line generating portion on the plasma generation region side.

48. (~~previously presented~~) canceled: A plasma generating apparatus according to claim 22, wherein a magnetic pole of said first magnetic force line generating portion on the plasma generation region side is opposite to a magnetic pole of said second magnetic force line generating portion on the plasma generation region side. Ex. Amdt.

49. (currently amended): A substrate processing apparatus for subjecting a surface of a substrate of a solid device to a treatment, comprising:

a vacuum vessel having a plasma generation region established in an interior thereof;

a gas inductor that inducts discharge gas into said interior of said vacuum vessel;

an exhaust that exhausts an atmosphere in the interior of said vacuum vessel;

a tube-shaped discharge electrode fashioned so as to enclose said plasma generation region;

a first high-frequency electric power applicator that applies first high-frequency electric power to said discharge electrode;

a first magnetic force line generating portion positioned near one portion of an outer periphery side of said discharge electrode;

a second magnetic force line generating portion positioned near the other end portion of an outer periphery side of said discharge electrode; and

a substrate stage on which the substrate is carried within said plasma generation region,

wherein said first and second magnetic force line generating portions generate magnetic force lines having portions roughly parallel to the center axis of said discharge electrode, such that the length of said parallel portions becomes longer the closer said magnetic force lines are to said center axis, said magnetic force lines being capable of trapping electrons at least in a center of said plasma generation region~~, and~~

~~wherein at least one of said first and second magnetic force line generating portions is overlapped with one end portion of the outer periphery side of the discharge electrode including the one end thereof~~.

50. (currently amended): A substrate processing apparatus for subjecting a surface of a substrate of a solid device to a treatment, comprising:

a vacuum vessel having a plasma generation region established in an interior thereof;

a substrate stage provided at a lower portion of said plasma generation region and having a substrate stage surface on which the substrate is carried within said plasma generation region, said substrate stage surface extending in a substantially horizontal direction;

a tube-shaped discharge electrode fashioned so as to enclose said plasma generation region and having a tube-shaped wall extending in a substantially vertical direction with respect to said substrate stage surface;

a first high-frequency electric power applicator that applies first high-frequency electric power to said discharge electrode;

a magnetic force line generating portion positioned at an outer periphery side of said discharge electrode;

an upper wall provided at an upper portion of said plasma generation region so as to oppose to said substrate stage;

a gas inductor that inducts discharge gas into said interior of said vacuum vessel; and

an exhaust that exhausts an atmosphere in the interior of said vacuum vessel,

wherein said magnetic force line generating portion generates magnetic force lines having portions roughly parallel to the center axis of said discharge electrode, such that the length of said parallel portions becomes longer the closer said magnetic force lines are to said center axis, said magnetic force lines being capable of trapping electrons at least in a center of said plasma generation region.

51. (previously presented): A substrate processing apparatus according to claim 50, further comprising:

a second high-frequency electric power applicator that applies second high-frequency electric power to said substrate stage,

wherein said upper wall is directly coupled to a reference voltage.

52. (previously presented): A substrate processing apparatus according to claim 51, wherein said second high-frequency electric power applicator is a resonance circuit that applies high-frequency electric power to said substrate stage.

53. (previously presented): A substrate processing apparatus according to claim 50, wherein said gas inductor inducts discharge gas into said interior of said vacuum vessel through said upper wall, and said exhaust exhausts the atmosphere in the interior of said vacuum vessel from the level side of said substrate stage.

Claims 54-60 (canceled).